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EXAMINER	
KRASNIC, BERNARD	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/698,111	HARVILLE, MICHAEL	
	Examiner	Art Unit	
	BERNARD KRASNIC	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 2/13/2008.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-40 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The amendment filed 2/13/2008 have been entered and made of record.

2. The application has pending claim(s) 1-40.

3. In response to the amendments filed on 2/13/2008:

The amendments to the drawings have been entered.

The amendments to the specification have been entered.

4. The Applicant's arguments with respect to claims 1-40 have been considered but are moot in view of the new ground(s) of rejection because the Applicant has amended independent claim(s) 1, 23, and 32 with the claim limitation "wherein said light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light" respectively.

5. Applicant's arguments filed 2/13/2008 have been fully considered but they are not entirely persuasive.

The Applicant alleges, “The instant Office Action states that Claims 1, 2, 4 …” in page 12 through “Moreover, no articulated reasoning is provided in the Rejection …” in page 14, and states respectively that Carrot’s X-ray, utlrasonography, magnetic resonance imaging, and other known imaging methods does not teach the amended claim limitations of "wherein said light is selected from the group of electromagnetic

radiation consisting of visible light, infrared light, and ultraviolet light" respectively and that Zhang does not overcome the shortcomings of Carrot either. The Examiner disagrees because Carrot teaches that other imaging methods may also be used instead of the X-ray system [the X-ray emits and senses X-ray light which goes away from the amended claim limitation]. These other mammography three dimensional imaging systems may include an optical tomography which is an obvious variant of Carrot's X-ray system, to one of ordinary skill in the art at the time the invention was made [see "First results from the Philips Optical Mammoscope" by Hoogenraad, SPIE, vol. 3194, pgs. 184-190, 1998] in order to provide a non-invasive non-ionizing breast diagnostic test; this optical tomography operates (emits and senses) under visible and infrared light. Therefore claims 1, 2 , 4, 6, 9, 11, 13-15, 18-23, 24, 26, and 28-31 are still not in condition for allowance because they are still not patentably distinguishable over the prior art references. See the claim rejections for further discussions.

The Applicant alleges, "Claims 3, 10, 12 …" in page 15 through "The instant application as claimed …" in page 16, and states respectively that Li teaches away from Carrot and Zhang because Li deals with face detection whereas Carrot and Zhang deal with breast lesion detection. The Examiner finds these arguments persuasive. However, the Examiner believes that Mahbub (US 2002/0050924 A1) teaches the independent claims 1 and 23 (also dependent claims 3, 4, 9, 12, 19-22, and 25-26) and deals with occupant / human sensing and that Li in view of Mahbub would be proper to teach the respective dependent claims (16, 17 and 27) since Li is further improving Mahbub's occupant / human detection system by further using actual face detection.

Also, Getty et al (US 6,031,565) and Campanini et al (US 7,181,056 B2) are used to further modify Carrot in order to show obviousness of respective dependent claims (3, 10, 16, 25, 27, 34, and 38). Therefore dependent claims 3, 10, 12, 16, 17, 19-22, 25, 27, 34, and 38 are still not in condition for allowance because they are still not patentably distinguishable over the prior art references. See the claim rejections below for further discussions.

Therefore claims 1-40 are still not in condition for allowance because they are still not patentably distinguishable over the prior art.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3, 4, 9, 12, 19-22, 23, and 25-26 rejected under 35 U.S.C. 102(b) as being anticipated by Mahbub (US 2002/0050924 A1).

Re Claim 23: Mahbub discloses a visual-based recognition system / occupant sensing system comprising a visual sensor / CCD stereo vision system for capturing depth data / 3D image relating to distance for at least a pixel of an image of an object / seating area of a vehicle with possible occupant (see [0045], lines 2-4, [0051], lines 1-3, [0081], lines 1-4, [0088]), said depth data / 3D image comprising information relating to a distance / distance from said visual sensor / CCD stereo vision system to a portion of said object /

seating area of vehicle with possible occupant visible at said pixel (see [0045], lines 2-4, [0051], lines 1-3, [0081], lines 1-4, [0088]), said visual sensor / CCD stereo vision system comprising an emitter and sensor of light (a CCD camera system inherently has an emitter and sensor of light), wherein said light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light (a CCD camera system inherently operates under visible light); a plan-view image generator / segmentation of a scene for generating a plan-view image / segmented 3D image based on said depth data / 3D image components relating to distance (see [0051], lines 1-3, [0059], [0061], lines 3-6, [0088], the 3D image is segmented to remove background clutter using thresholding means with the 3D X Y and Z components which relate to the distance of the object to the imaging camera system); a plan-view template generator / 2D image generator for generating a plan-view template / 2D XY, YZ, or ZX plane images based on said plan-view image / segmented 3D image (see [0088], the segmented 3D image is projected to a 2D data set which will be used to classify for specific scenarios [e.g. occupant present, occupant not present, etc.]); and a classifier / robust classifier for making a decision concerning recognition of said object / distinguish between scenarios, wherein said classifier is trained to make said decision according to pre-configured parameters / 2D features that were determined at least in part based on a class assigned to said plan-view template / 2D XY, YZ or ZX plane images (see [0081], lines 1-4, [0088], [0111], the robust classifier trained with the 2D features [the different 2D features are represented by Central Moments, Normalized moments, invariant moments, perimeter, area, eccentricity, etc.] with respect to the 2D plane

images classifies if there is an occupant in the seating area, occupant forward facing, occupant reverse facing, etc.).

As to claim 1, the claim is the corresponding method claim to claim 23 respectively. The discussions are addressed with regard to claim 23.

Re Claim 25: Mahbub further discloses wherein said visual sensor / CCD stereo vision system determines said depth data / 3D image relating to distance using stereopsis / stereo vision based on image correspondences (see [0045], lines 2-4, [0051], lines 1-3, [0081], lines 1-4, [0088]).

Re Claim 26: Mahbub further discloses said plan-view image generator comprises a pixel subset selector / ROI for selecting a subset of pixels of said image, wherein said pixel subset selector / ROI is operable to select said subset of pixels based on foreground segmentation / segmentation of scene (see [0059], the segmentation of a scene determines the region of interest ROI by removing and eliminating background clutter).

As to claims 3-4, the claims are the corresponding method claims to claims 25-26 respectively. The discussions are addressed with regard to claims 25-26.

Re Claim 9: Mahbub further discloses wherein said extracting said plan-view template from said plan-view image is based at least in part on object tracking (see [0059], the respective seating area is tracked and that respective area is extracted as a XY, YZ, or ZX plane image).

Re Claim 12: Mahbub further discloses said object is a person / occupant (see [0081], lines 1-4).

Re Claim 19: Mahbub further discloses wherein said decision is to distinguish between a human / occupant and a non-human / no occupant (see [0081], lines 1-4).

Re Claim 20: Mahbub further discloses wherein said decision is to distinguish between a plurality of different human body orientations / orientations (see [0126]-[0127]).

Re Claim 21: Mahbub further discloses wherein said decision is to distinguish between a plurality of different human body poses / orientations or actual occupancy (see [0081], lines 1-4, [0126]-[0127], the different body poses may be the different body orientations or just the presence or no presence of the human occupant).

Re Claim 22: Mahbub further discloses wherein said decision is to distinguish between a plurality of different classes of people / infant, occupant, child (see [0081], lines 1-4,

the different classes of people may be the different type of humans such as an infant, child or adult occupant).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 16, 17, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahbub in view of Li et al (US 2003/0108244 A1, as applied in previous Office Action). The teachings of Mahbub have been discussed above.

However, Mahbub fails to teach of fairly suggest that the classifier is a support vector machine and that the plan-view template is a vector basis obtained by principal component analysis (PCA).

Li, as recited in claim 16, discloses said plan-view template / frontal face view is represented in terms of a vector basis / SVM's (see page 1, paragraph [0008], lines 18-24, [0011], lines 4-7).

Li, as recited in claim 17, discloses said vector basis is obtained through principal component analysis (PCA) (see page 1, paragraph [0008], lines 18-24, "PCA as they rotate and use the SVM's").

Li, as recited in claim 27, discloses said classifier is a support vector machine / SVM's (see page 1, paragraph [0008], lines 18-24, "PCA as they rotate and use the SVM's for multi-pose face detection").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mahbub's occupancy sensing system and method using Li's teachings by including the capabilities of having the classifier be a support vector machine and the plan-view template being a vector basis obtained by principal component analysis (PCA) in order to detect a person's face in input images containing either frontal or non-frontal views regardless of the scale or illumination conditions associated with the face (see [0011], lines 4-7).

10. Claims 1, 2, 4, 6, 9, 11, 13-15, 18, 23, 24, 26, and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrot et al (US 6909792 B1, as applied in previous Office Action), in view of Zhang et al (US 5,491,627, as applied in previous Office Action) and Hoogenraad ("First results from the Philips Optical Mammoscope", SPIE, vol. 3194, pgs. 184-190, 1998).

Re Claim 1: Carrot discloses a method for visual-based recognition (see Abstract, lines 1, and 11-15) of an object / breast, said method comprising receiving depth data (see Fig. 7, col. 6, line 21, depth or z') for at least a pixel of an image of an object, said depth data comprising information relating to a distance from a visual sensor (see col. 6, lines 5-26, distance from the ultrasonic scanner [an ultrasonographic imaging system or its

equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system] to the different parts of the breast tissue, col. 2, lines 41-44, col. 1, lines 25-28) to a portion of said object / breast shown at said pixel, said visual sensor / X-ray system comprising an emitter and sensor of light (see col. 2, lines 41-44, col. 1, lines 25-28, an ultrasonographic imaging system or its equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system, an X-ray system operates using emitters to emit x-ray light and light sensors to detect the light on the opposite end); generating a plan-view image / slice (167) (see Fig. 7, col. 9, lines 22-23, <u>*each slice is one*</u> or more <u>*layers of the three dimensional*</u> ultrasonorgraphic <u>*image data*</u>*, one layer of a three dimensional image is a slice or a two dimensional image plan view*) based in part on said depth data; extracting a plan-view template / entire slice (167) (see Fig. 7, the template may be the entire slice / plan-view image itself) from said plan-view image; and processing said plan-view template / entire slice (167, see Fig. 7) at a classifier / correlator (30) (see Fig. 1, col. 2 line 45-47) to assign a class / abnormalities such as suspect lesions to said plan-view template, wherein said classifier / correlator is trained / automated method to make a decision / suspect or not suspect lesion according to pre-configured parameters / library with defined pathological region data determined at least in part based on said class / abnormalities such as suspect lesions of said plan-view template (see Carrot, col. 3, lines 33-43, the plan-view template or slice is classified as having a suspect lesion or not having a suspect lesion by a correlator which does a correlation with a library which has a defined pathological region data signifying abnormalities such as lesions).

However, Carrot fails to specifically suggest how the classifier is actually trained to make a decision. Carrot also fails to specifically suggest that emitted and sensed light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light [Carrot's X-ray system emits and senses x-ray light].

Zhang discloses that the classifier / neural network is trained to make a decision / positive or negative detections (see Zhang, col. 1, lines 52-58, the neural network is trained to output either a positive detection of a micro-calcification on the mammogram or a negative detection).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Carrot's method using Zhang's teachings by including a neural network type system to Carrot's abnormality classifier in order to improve the classification by reducing the false-positive detections by limiting the detection to either a positive detection of an abnormality within the mammogram image or a negative detection (see Zhang, col. 1, lines 52-58).

However, Carrot as modified by Zhang still fails to specifically suggest that emitted and sensed light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light [Carrot's X-ray system emits and senses x-ray light].

Hoogenraad discloses depth data / depth or z of the 3D breast images comprising information relating to a distance / depth or z of the 3D breast images from a visual sensor / optical mammoscope to a portion of said object / breast, said visual sensor comprising an emitter and sensor of light (see Figure 1, the optical

mammascope operates using emitters to emit visible or infrared light and light sensors to detect the visible or infrared light on the opposite end), wherein said light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light (see abstract, page 184, paragraph “The use of light to image …”, Figure 2 as an example of 780nm wavelength light which corresponds to visible or near infrared light but in general this optical tomography system operates with visible or infrared light).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Carrot’s method, as modified by Zhang, using Hoogenraad’s teachings by replacing Carrot’s X-ray system with the Optical Tomography Mammoscope in order to provide a non-invasive non-ionizing breast diagnostic test (see Hoogenraad, page 184, "the use of X-rays for diagnostic purposes might cause side effects" if used frequently due to the excessive exposure to the x-ray light).

Re Claim 2: Carrot further discloses receiving non-depth data / color (see col. 2, line 57, multicolor imagery) for said pixel.

Re Claim 4: Carrot further discloses selecting a subset / ROI of said depth data / multicolored data based on foreground segmentation / thresholding multicolored data (see col. 3, lines 58-60, getting ROI with thresholding gives features of breast, col. 3, lines 40-43).

Re Claim 6: Carrot further discloses receiving non-depth data / multicolored data for said pixel, and wherein said foreground segmentation / thresholding multicolored data is based at least in part on said non-depth data (see col. 1, lines 64-66, Abstract, lines 13-15, thresholding on ROI colored image, col. 3, lines 58-60).

Re Claim 9: Carrot further discloses extracting said plan-view template from said plan-view image is based at least in part on object tracking / ROI (see col. 3, lines 25-36 and 40-43, tracking ROI).

Re Claims 11: Carrot further discloses said plan-view image is based in part on said non-depth data (see col. 2, line 57, multicolor imagery, each slice or plan-view will also have multicolor imagery).

Re Claim 13: Carrot further discloses said plan-view image comprises a value based at least in part on an estimate of height / depth z' of a portion of said object / breast above a surface /pressure plate (83, 84) (see Fig. 3, col. 5, lines 59-61, the depth is considered as an estimate of height a result of the breast being on a pressure plate).

Re Claim 14: Carrot further discloses said plan-view image comprises a value based at least in part on color data for a portion of said object (see Abstract, lines 13-15, col. 1,

lines 64-65, col. 3, lines 4-8, col. 2, line 57, multicolor imagery, each slice or plan-view will also have multicolor imagery).

Re Claim 15: Carrot further discloses said plan-view image comprises a value based at least in part on a count of pixels / ROI obtained by said visual sensor and associated with said object (see col. 3, lines 27-44, col. 4, lines 26-28, ROI has a certain amount or count of pixels).

Re Claim 18: Carrot further discloses performing height normalization / depth z' based on pressure plate (83, 84) on said plan-view template / slice (167) (see Figs. 3 and 7, col. 5, lines 59-61, the depth is considered as a height normalization as a result of the breast being on a pressure plate, the three dimensional image is therefore dependent upon the height normalization and therefore each template or slice is dependent upon the height normalization).

Re Claim 23: Carrot discloses a visual-based recognition system comprising a visual sensor (20) (see Fig. 1, col. 2, lines 41-45, Abstract, lines 1, and 11-15) for capturing depth data (see Fig. 7, col. 6, line 21, depth or z') for at least a pixel of an image of an object / breast, said depth data comprising information relating to a distance from said visual sensor (see col. 6, lines 5-26, distance from the ultrasonic scanner [an ultrasonographic imaging system or its equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system] to the different parts of

the breast tissue, col. 2, lines 41-44, col. 1, lines 25-28) to a portion of said object visible at said pixel, said visual sensor / X-ray system comprising an emitter and sensor of light (see col. 2, lines 41-44, col. 1, lines 25-28, an ultrasonographic imaging system or its equivalent may be used to produce this visual depth data, its most common equivalent being the X-ray system, an X-ray system operates using emitters to emit x-ray light and light sensors to detect the light on the opposite end); a plan-view image generator (20,24) for generating a plan-view image / slice (167) (see Fig. 7, col. 9, lines 22-23, *each slice is one* or more *layers of the three dimensional* ultrasonorgraphic *image data, one layer of a three dimensional image is a slice or a two dimensional image plan view*) based on said depth data; a plan-view template generator (20,24) for generating a plan-view template / slice (167) (see Fig. 7, the template may be the entire slice / plan-view image itself) based on said plan-view image; and a classifier / correlator (30) (see Fig. 1, col. 2 line 45-47) for making a decision concerning recognition / suspect or not suspect lesion of said object, wherein said classifier / correlator is trained / automated method to make said decision according to pre-configured parameters / library with defined pathological region data that were determined at least in part based on a class / abnormalities such as suspect lesions assigned to said plan-view template (see Carrot, col. 3, lines 33-43, the plan-view template or slice is classified as having a suspect lesion or not having a suspect lesion by a correlator which does a correlation with a library which has a defined pathological region data signifying abnormalities such as lesions).

However, Carrot fails to specifically suggest how the classifier is actually trained to make a decision. Carrot also fails to specifically suggest that emitted and sensed light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light [Carrot's X-ray system emits and senses x-ray light].

Zhang discloses that the classifier / neural network is trained to make a decision / positive or negative detections (see Zhang, col. 1, lines 52-58, the neural network is trained to output either a positive detection of a micro-calcification on the mammogram or a negative detection).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Carrot's system using Zhang's teachings by including a neural network type system to Carrot's abnormality classifier in order to improve the classification by reducing the false-positive detections by limiting the detection to either a positive detection of an abnormality within the mammogram image or a negative detection (see Zhang, col. 1, lines 52-58).

However, Carrot as modified by Zhang still fails to specifically suggest that emitted and sensed light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light [Carrot's X-ray system emits and senses x-ray light].

Hoogenraad discloses depth data / depth or z of the 3D breast images comprising information relating to a distance / depth or z of the 3D breast images from a visual sensor / optical mammoscope to a portion of said object / breast, said visual sensor comprising an emitter and sensor of light (see Figure 1, the optical

mammascope operates using emitters to emit visible or infrared light and light sensors to detect the visible or infrared light on the opposite end), wherein said light is selected from the group of electromagnetic radiation consisting of visible light, infrared light, and ultraviolet light (see abstract, page 184, paragraph “The use of light to image …”, Figure 2 as an example of 780nm wavelength light which corresponds to visible or near infrared light but in general this optical tomography system operates with visible or infrared light).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Carrot’s method, as modified by Zhang, using Hoogenraad’s teachings by replacing Carrot’s X-ray system with the Optical Tomography Mammoscope in order to provide a non-invasive non-ionizing breast diagnostic test (see Hoogenraad, page 184, "the use of X-rays for diagnostic purposes might cause side effects" if used frequently due to the excessive exposure to the x-ray light).

Re Claim 24: Carrot further discloses said visual sensor is also for capturing non-depth data / color (see col. 2, line 57, multicolor imagery).

Re Claim 26: Carrot further discloses a pixel subset selector (52, 24) for selecting a subset / ROI of pixels of said image, wherein said pixel subset selector is operable to select said subset of pixels based on foreground segmentation / thresholding

multicolored data (see Figs. 1 and 2a, see col. 3, lines 58-60, getting ROI with thresholding gives features of breast, col. 3, lines 40-43).

Re Claim 28: Carrot further discloses said plan-view image is based in part on said non-depth data (see col. 2, line 57, multicolor imagery, each slice or plan-view will also have multicolor imagery).

Re Claim 29: Carrot further discloses to generate a three-dimensional point cloud / three dimensional data set based on said depth data / direction z', wherein a point of said three-dimensional point cloud comprises a three-dimensional coordinate / x', y', z' (see Fig. 7, col. 3, lines 4-7, col. 6, lines 20-21).

Re Claim 30: Carrot further discloses to divide said three-dimensional point cloud / three dimensional data set into a plurality of slices such that a plan-view image (167) may be generated for at least one slice of said plurality of slices (see Fig. 7, col. 3, lines 4-7, col. 9, lines 16-27).

Re Claim 31: Carrot further discloses to extract a plan-view template / slice (167) from at least two plan-view images / plurality of slices corresponding to different slices of said plurality of slices, wherein said plan-view template comprises a transformation / summing data points of at least a portion of said plan-view images / entire slice, such

that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

11. Claims 5, 7, 8, 32, 33, 35-37, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrot, as modified by Zhang and Hoogenraad, as applied to claims 1 and 23 above. The teachings of Carrot, as modified by Zhang and Hoogenraad have been discussed above.

Re Claim 5 and 32 respectively: Carrot, <u>as recited in claim 5</u>, further discloses generating a three-dimensional point cloud / three dimensional data set of said subset / ROI of pixels based on said depth data / direction z' (col. 3, lines 27-37 and 40-43, col. 6, lines 20-21), wherein a point of said three-dimensional point cloud comprises a three-dimensional coordinate / x', y', z' (see Fig. 7, col. 3, lines 4-7); partitioning said three-dimensional point cloud into a plurality of vertically oriented bins; and mapping at least a portion of points of said plurality of vertically oriented bins into at least one said plan-view image / ROI or slice addition based on said three- dimensional coordinates, wherein said plan-view image is a two-dimensional representation / slice of said three-dimensional point cloud comprising at least one pixel corresponding to at least one vertically oriented bin of said plurality of vertically oriented bins (see col. 3, lines 27-37 and 40-43, ROI may cover these vertical bins, col. 9, lines 22-26, addition of all the possible slices will then cover all the bins).

Although the partitioning step of Carrot's three dimensional cloud is not specifically disclosed, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to have such a feature where the vertical bin is each depth or z' axis point, so for example, if the point [x',y'] is looked at, all the same points [x',y'] along the different z' values creates a vertical bin.

As to claim 32, all the limitations are taught by Carrot and Zhang and Hoogenraad in the same manner as Carrot and Zhang and Hoogenraad taught claims 1, 5, and 6 respectively above.

Re Claim 7: Carrot further discloses dividing said three-dimensional point cloud into a plurality of slices (164, 167), and wherein said generating said plan-view image / slice (167) is performed for at least one slice of said plurality of slices (see Fig. 7, col. 3, lines 4-7).

Re Claim 8: Carrot further discloses extracting a plan view template / slice (167) from at least two plan-view images / plurality of slices corresponding to different slices of said plurality of slices, wherein said plan-view template comprises a transformation / summing data points of at least a portion of said plan-view images / entire slice, such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

Re Claim 33: Carrot further discloses said three-dimensional point cloud / three dimensional data set and said plan-view image / entire slice (167) are also based at

least in part on non-depth data / multicolored data (see Fig. 7, col. 1, lines 64-65, col. 3, lines 4-7, Abstract, lines 11-15).

Re Claim 35: Carrot further discloses wherein said plan view template comprises a transformation / summing data points of at least a portion of said plan view image / entire slice (167), and such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

Re Claim 36: Carrot further discloses dividing said three-dimensional point cloud / three dimensional data set of into a plurality of slices, and wherein said mapping / summing data points at least a portion of points comprises mapping points within a slice of said plurality of slices of said three-dimensional point cloud into said plan-view image / slice (see col. 3, lines 4-7, col. 9, lines 22-27).

Re Claim 37: Carrot further discloses wherein said plan view template comprises a transformation / summing data points of at least a portion of said plan view image / entire slice (167), such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

Re Claim 39: Carrot further discloses said plan-view image / slice is generated from a subset / ROI of pixels of said image selected based on foreground segmentation /

thresholding multicolored data (see col. 3, lines 58-60, getting ROI with thresholding gives features of breast, col. 3, lines 40-43).

Re Claim 40: Carrot further discloses extracting a plan view template / entire slice (167) from at least two plan view images corresponding to different slices of said plurality of slices, wherein said plan view template comprises a transformation / summing of data points of at least a portion of said plan view images / entire slice (167), such that said plan-view template is processed at said classifier (see Fig. 7, col. 9, lines 22-27).

12. Claims 3, 25, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrot, as modified by Zhang and Hoogenraad, as applied to claims 1, 23 and 32 above, and further in view of Getty et al (US 6,031,565). The teachings of Carrot as modified by Zhang and Hoogenraad have been discussed above.

However, Carrot as modified by Zhang and Hoogenraad, fails to teach of fairly suggest depth data is determined by stereopsis.

Getty, as recited in claim 3 and claim 34 respectively, discloses said depth data using stereopsis / one or more x-ray's based on image correspondences (see Getty, col. 2, lines 4-7, Getty's stereopsis x-ray system improves Carrrot's x-ray system by fusing two images to provide highly accurate image registration).

Getty, as recited in claim 25, discloses said visual sensor determines said depth data using stereopsis / one or more x-ray's based on image correspondences (see

Getty, col. 2, lines 4-7, Getty's stereopsis x-ray system improves Carrrot's x-ray system by fusing two images to provide highly accurate image registration).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Carrot's method, as modified by Zhang and Hoogenraad, using Getty's teachings by including a stereopsis analysis to the Carrots imaging system in order to provide a highly accurate image registration (see Getty, col. 2, lines 6-7).

13. Claims 10, 16, 27, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrot, as modified by Zhang and Hoogenraad, as applied to claims 1, 23 and 32 above, and further in view of Campanini et al (US 7,181,056 B2). The teachings of Carrot as modified by Zhang and Hoogenraad have been discussed above.

However, Carrot as modified by Zhang and Hoogenraad, fails to teach of fairly suggest that the classifier is a support vector machine.

Campanini, as recited in claim 10, discloses said classifier is a support vector machine / SVM's (see Campanini, col. 2, lines 40-47, slices or plan-view image will be affected by SVM's).

Campanini, as recited in claim 16, discloses said plan-view template is represented in terms of a vector basis / SVM's (see Campanini, col. 2, lines 40-47, since slices or plan-view image will be affected by SVM's, so will the templates since the template is the entire slice).

Campanini, as recited in claim 27 and claim 38 respectively, discloses said classifier is a support vector machine / SVM's (see Campanini, col. 2, lines 40-47, slices or plan-view image will be affected by SVM's).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Carrot's method, as modified by Zhang and Hoogenraad, using Campanini's teachings by including a SVM analysis to the Carrots imaging system in order to achieve an improved classification (see Campanini, col. 2, lines 40-47).

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BERNARD KRASNIC whose telephone number is (571)270-1357. The examiner can normally be reached on Mon-Thur 8:00am-4:00pm and every other Friday 8:00am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh M. Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bernard Krasnic
May 27, 2008
/Brian Q Le/
Primary Examiner, Art Unit 2624